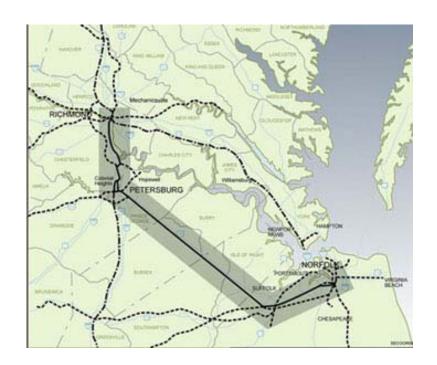
Richmond to South Hampton Roads High-Speed Rail Feasibility Study

TASK 2 - ENVIRONMENTAL OVERVIEW





Prepared for: Virginia Department of Rail and Public Transportation



1 SUMMARY

1.1 PURPOSE OF REPORT

An initial overview of environmental constraints that should be considered as part of the development of high-speed rail (HSR) service between Richmond and South Hampton Roads is presented in this report. Information on natural resources, cultural resources, and social and community resources within a general buffer of the proposed alternatives is provided. Potential environmental constraints are reported based on a review of readily available data. A more detailed environmental analysis will be needed once a preferred alternative is selected.

The findings of the environmental constraints analysis, including a summary matrix that compares the potential environmental constraints along the corridor, are summarized in this chapter. The project background and location is briefly described in Chapter 2. The environmental resources and issues within the HSR corridor study area are characterized in Chapter 2 and their compatibility with implementation of HSR between Richmond and South Hampton Roads, utilizing rail routes south of the James River, is discussed.

1.2 ENVIRONMENTAL CONSTRAINTS SUMMARY

Because the alternatives under consideration are located almost entirely within existing or abandoned rail rights or way, environmental impacts are anticipated to be minimal. Limited environmental documentation should be required for most of the corridor. Categorical Exclusions should be sufficient in areas that are free of environmental constraints and where only operating changes or minor capital improvements within existing rights-of-way are proposed. In many segments of the corridor, environmental constraints may be present within the buffer analyzed, but the use of only existing tracks would also limit the need for extensive environmental documentation. More detailed environmental analyses would have to be completed to determine the full level of documentation required.

A summary of the environmental resources and potential constraints within the 300-foot buffer of the proposed HSR right of way is provided in Table 1-1. The resources included in this summary table would not necessarily be affected by the construction and implementation of HSR between Richmond and South Hampton Roads.

Table 1-1 Summary Matrix of Environmental Resources and Constraints Assessed Within 300 Feet of the HSR Right of way

Number of Existing Resources and Potential Constraints	HSR Corridor with Dunlop Connection	HSR Corridor with Ettrick Connection
Noise-Sensitive Receptors ¹	8	8
Stream Crossings	29	29
Wetlands (ac)	576.6	584.4
Floodplain Crossings	27	27
Threatened and Endangered Species	34	34
Wildlife Refuges	1	1
Traffic (total number of road crossings)	129	133
Above-Grade Crossings	25	24
At-Grade Crossings	98	101
Below-Grade Crossings	6	8
Community Facilities and Services (Total Resources)	19	19
Schools	2	3
Religious Institutions	6	5
Cemeteries	5	5
Airports	1	1
Landmarks	4	4
Parks and Recreational Areas	1	1
Transportation (bus) terminals	0	0
Government/Municipal Buildings ²	0	0
Historic & Archaeological Resources ³	4	5
Hazardous Waste Sites ⁴	16	16

¹ Number of Category 3 receptors within 150 feet of existing lines.
2 Including Town Capital Buildings, Town Halls, Courthouses, Libraries, Police, Auditoriums, Police Stations, Fire/Rescue Stations, Hospitals.
3 Listed on or eligible for listing on the National Register of Historic Places.
4 Located within 2 miles.

Several geographic areas of environmental concern where more detailed environmental documentation is expected to be necessary have been identified. The areas of environmental complexity where there is a potential for environmental impacts or difficulty in obtaining permits include:

- Crossing of the Appomattox River at Petersburg –New bridges would be required for the
 Ettrick Connection and the Dunlop Connection. The construction of the new bridges could
 permanently alter floodplains and historic districts and temporarily impact aquatic habitats in
 the Appomattox River. Further investigation would be necessary to determine the nature
 and degree of these effects. The Dunlop Connection would also require construction of a
 connection within the boundaries of the Battersea Historic District for Florida-bound trains.
- Kilby Connection New construction would be required for the connection of the existing Norfolk Southern (NS) line, which runs northwest-southeast, to the CSXT line, which runs west-east at its junction with the NS line. This connection may displace wetlands and residences near Kilby.
- Waverly provisions of service and potential for noise and vibration impacts to residential
 areas adjacent to the railroad and low-income or minority populations that may be
 disproportionately affected.
- Station Construction at Sunray Although construction would avoid most environmental resources, there are potential impacts on traffic, public safety, and the nearby Great Dismal Swamp National Wildlife Refuge and the Hampton Roads Wetland Mitigation Bank.
- Crossing of the Great Dismal Swamp National Wildlife Refuge

 the potential for noise or vibration impacts in close proximity to a significant natural resource, 4(f) property, and sensitive habitats that support rare, threatened, and endangered species.
- Noise Impacts in Chesapeake and South Norfolk as the corridor approaches the cities of Chesapeake and Norfolk, several neighborhoods and residential areas are in close proximity to the tracks. Noise studies would be necessary to determine any effects.

Additional environmental analysis would be needed to determine the interactions of the proposed corridors and these environmental constraints. Limited environmental documentation may be required if changes to existing railroad rights-of-way to implement the proposed rail service are minimal. However, from an overview perspective, the locations listed above could have the most complex environmental issues within the corridor. Once more detailed design information is available, further environmental information would be prepared to determine the significance of impacts. None of these concerns, however, represents a "fatal flaw" for the Richmond to South Hampton Roads HSR.

ENVIRONMENTAL RESOURCES AND CONSTRAINTS

2.1 PROJECT DESCRIPTION AND LOCATION

The proposed Richmond to South Hampton Roads HSR corridor would originate at Main Street Station in Richmond and terminate at Harbor Park in Norfolk, passing through six cities, five counties, and several small towns along the way. A general location map of the study area and location of the alternatives is provided in Figure 2-1.

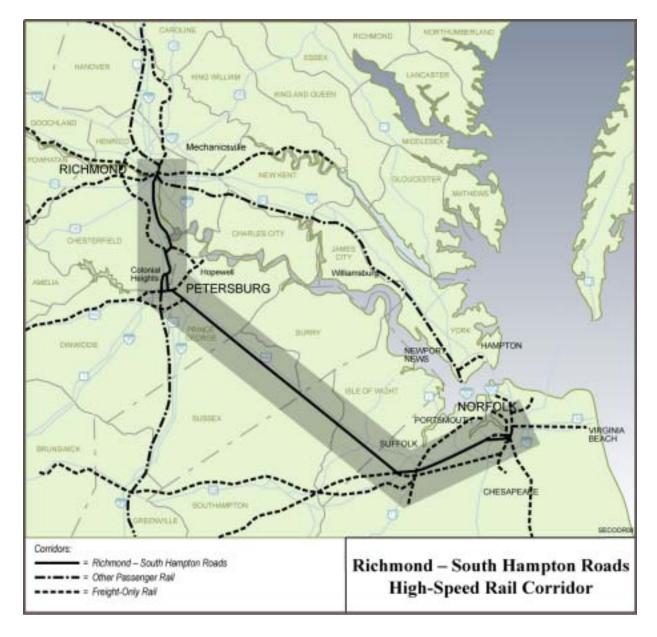
The alternatives that were considered for this analysis would follow essentially the same alignment throughout most of the corridor, except through the city of Colonial Heights and across the Appomattox River. The alternative that includes an alignment through Petersburg on the original Atlantic Cost Line Railroad route between Dunlop and the NS Main Line will be referred to in this document as the Dunlop Connection. The alternative that includes an alignment that heads southwest to Ettrick and connects to the NS Main Line east of the existing CSX Appomattox River Bridge will be referred to as the Ettrick Connection. The alternatives converge at the location of the old downtown Petersburg station, following the same alignment for the remainder of the distance to Norfolk. A more detailed look at the Dunlop and Ettrick Connections is provided in Figure 2-2. For the most part, both alternatives utilize existing railroad tracks or would be constructed almost entirely within existing railroad rights-of way.

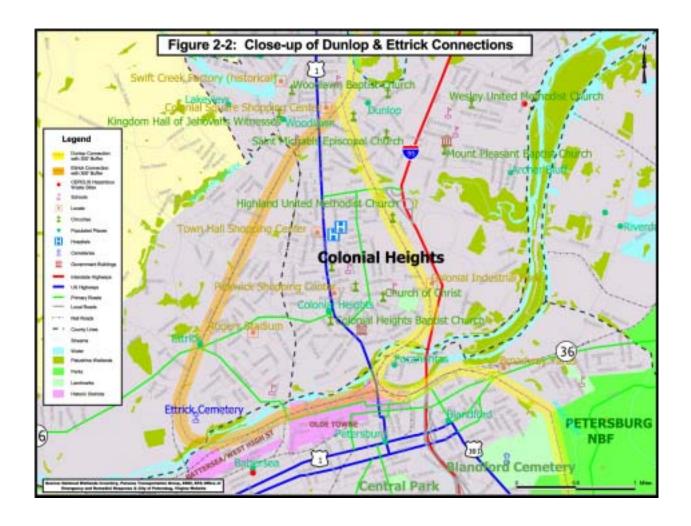
Because the existing bridge over the Appomattox River has a single-track, it was necessary to consider alternative alignments that would minimize scheduling conflicts between passenger and freight trains at the river crossing. Duplicating the existing high-bridge would be more expensive than other potential options, and different routes across the Appomattox could have the potential to better serve downtown Petersburg with a downtown station, if feasible. As a result, the following alternatives were considered:

- Continuing on the A Line to a connection at Collier;
- Restoring the S Line to a Secoast Connection (at Chaparral Steel) with a high bridge, upstream; and
- Restoring the S Line to a West Connection to the NS Main with a high bridge, upstream.

Most of the alternatives were dismissed due to cost, circuitry, and/or interference with freight trains. The second and third options would require a high bridge to carry a restored S Line upstream from the existing A Line bridge. None offered a more desirable station location than either the Dunlop or Ettrick Connections.

Figure 2-1: Location of Richmond to South Hampton Roads High-Speed Rail Feasibility Study





Using the NS Belt Line would be likely to reduce the length of the S Line that would need to be restored, but this route would be longer for passenger trains and would have more freight train movements. This would have necessitated more second track, increasing the cost without resolving the freight and passenger train conflicts. After comparing the various possibilities, the Dunlop and Ettrick alternatives were found to be substantially better than the others, and no further study of the others was undertaken.

A more detailed description of these alternatives is provided in the *Richmond to South Hampton Roads High-Speed Rail Feasibility Study* prepared by Parsons Transportation Group, Inc.

2.2 ENVIRONMENTAL CONSTRAINTS MAPPING

Environmental constraints mapping was developed from existing GIS data and is presented in three large maps of the study area. The northern portion of the study area from Richmond to south of Petersburg is shown in Map 1; the counties of Prince George, Sussex, Surry, Southampton, and Isle of Wight are covered in Map 2; and the southeastern portion of the study area from Suffolk to Norfolk is illustrated in Map 3. The alternative routes for the HSR corridor with a 300-foot (ft) buffer surrounding each alignment are illustrated on these maps. The surrounding natural, cultural, and community resources along the alignments are illustrated and labeled also.

A Geographic Information System (GIS) database was created in ArcView 3.2a by compiling natural, cultural, and community resources data from ESRI, Tiger, the Federal Emergency Management Agency (FEMA), and the U.S. Fish and Wildlife Service (FWS) National Wetlands Inventory (NWI). Additional features were digitized and labels were added to the GIS based on information from the U.S. Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), Alexandria Drafting Company (ADC) maps for Petersburg and Vicinity (7th Edition), City of Petersburg website, and U.S. Geologic Survey (USGS) topographic quadrangle maps for the project area. While some resources may not be visible on the printed environmental constraints maps due to the illustration of the 300-foot buffer, all existing resources are contained within the GIS database and were included in the analysis of constraints.

2.3 TRAFFIC

Potential impacts to roadway traffic from the implementation of HSR passenger service between Richmond and South Hampton Roads were assessed based on information from the GIS database and ADC maps for the project area. Road names and classifications were used to determine the compatibility of HSR operations with existing traffic volumes at road crossings throughout the HSR corridor. Additional traffic data was not collected for this analysis.

Detailed information about current train operations along the rail segments that comprise the proposed Richmond-South Hampton Roads HSR corridor can be found in the *Richmond to South Hampton Roads High-Speed Rail Feasibility Study*.

Due to the lack of readily available traffic information at this preliminary stage, a general assessment of potential roadway traffic issues was conducted. The assessment considered all roadways within the study area that would be crossed by the HSR right of way and also identified the type of crossing: above-grade (roadway crosses rail line via a bridge), at-grade, or

below-grade (rail line crosses roadway via a bridge). This information is presented in the Appendix B.

As indicated in Appendix B, a total of 136 roadway crossings of various types and roadway classifications are located within the corridor study area. In the area just north of the Appomattox River, two rail segments are proposed: the Ettrick Connection, which would follow an existing active rail LINR, and the Dunlop Connection, which would follow an abandoned rail right-of-way east of the Ettrick Connection. Both segments would merge with the NS Main Line on the south side of the Appomattox River. The Ettrick connection would cross the river on a bridge downstream from the A Line bridge, and at a lower elevation, to join the NS Line east of the bridge. The Dunlop Connection would join the NS Line at a location just east of the existing U.S. Route 1 bridge over the Appomattox River (Dr. Martin Luther King, Jr. Memorial Bridge). Aside from these two alternative segments, the proposed HSR corridor follows one route between Richmond and South Hampton Roads. The total number of roadway crossings, including above-, below- and at-grade, along the HSR corridor is 133 on the Ettrick Connection, whereas the total number of roadway crossings on the Dunlop Connection is 129.

Of all the roadway crossings identified in Appendix B, those designated as at-grade crossings pose the greatest traffic and safety concerns. At-grade crossings involving U.S.- and state-designated highways pose the greatest traffic and safety concerns and will need to be closely evaluated at the next stage of this project to identify potential traffic impacts and safety issues. Possible resolutions and/or mitigation measures could include grade separation options, upgraded signal and gate systems, or even the closure of an at-grade crossing. Refer to the Public Safety section of this preliminary environmental screening report for additional information.

Intracoastal Waterway

The proposed HSR right of way would cross the South Branch of the Elizabeth River; designated as the Intracoastal Waterway, on a vertical lift bridge. Although once a mainline track with an operational traffic control system, this rail line now experiences very little freight activity, and train speed is limited to only 10 miles per hour. The provision of HSR passenger service along this section of rail would result in a noticeable increase in the number of trains crossing the Intracoastal Waterway, and a corresponding increase in the number of bridge closings. Presently, the vertical lift bridge is left in the open position, yielding the right-of-way to boat traffic along the Intracoastal Waterway. The additional number of bridge closings would result in temporary delays to boaters but is not considered an adverse impact on the Intracoastal Waterway because the bridge closings would be limited to only a few closings per day, would be of a short duration, and would coincide with train schedules that will be available to the public.

2.4 LAND USE AND NEIGHBORHOODS

2.4.1 General Land Use

Like many areas across the United States, development within the proposed HSR corridor has been influenced primarily by transportation infrastructure. Nineteenth-century rail construction spawned the growth of numerous communities, some of which were later bypassed with the construction of the interstate highway system in the 1950s and 1960s.

The termini for the HSR corridor are located in the major population centers of Richmond and Norfolk. The northwestern terminus would be the Main Street Station in Richmond, which is proposed to be reopened in 2003. The southeastern terminus is located on the eastern side of the parking lot of Harbor Park, the minor league baseball stadium in Norfolk. Land use along the proposed HSR corridor in the cities of Richmond, Norfolk, and Petersburg consists of dense commercial, retail, and industrial development, and, to a lesser degree, park, residential and institutional land uses. In suburban areas, such as Chesterfield County, the city of Colonial Heights, the city of Suffolk, and the city of Chesapeake, land uses along the corridor are primarily commercial, retail, and industrial, with a higher concentration of medium and high density residential development. Residential development is particularly concentrated along the Chesapeake/Portsmouth City line, immediately north of the HSR right of way.

Numerous rural communities along U.S. Route 460, including Disputanta, Waverly, Wakefield, Ivor, and Windsor among others, are located between the major populated areas at the northwestern and southeastern termini of the route. Land use along the rail corridor through this region is primarily agricultural, with very limited commercial, light industrial, and low-density residential development located proximate to modest town centers. In Suffolk and the western portion of Chesapeake, the HSR right of way passes along the northern boundary of the Great Dismal Swamp National Wildlife Refuge, an expansive, undeveloped area consisting primarily of forested wetlands.

An existing GIS database, field notes, and ADC mapping were used for this general land use assessment. The GIS database contained very little land use information other than points designating populated areas along the corridor. Local jurisdictions were not contacted for plans of development, land use, or zoning information. A more detailed analysis of land use may be required at a later time, in which case, local contacts would be made to obtain and review this information.

2.4.2 Land Use Impacts

The proposed route is comprised entirely of active rail lines or abandoned rail rights-of-way that run either through or adjacent to established cities and towns. With the exception of new passenger stations and right-of-way modifications through Colonial Heights and Petersburg, the only location requiring new construction would be near Kilby, where the Norfolk Southern (NS) railroad would be connected to the CSXT line. This area is characterized by low-density residential and agricultural land uses.

The use of existing or abandoned railroads throughout the HSR corridor is expected to avoid altering regional land use patterns. Land use development patterns are more likely to be influenced by the amount of land available for development or redevelopment; regional and local markets; and comprehensive land use and development plans and zoning ordinances of local governments.

Given that all of the affected communities are already located near existing active rail lines and have experienced rail traffic for a number of years, the effects that the Richmond to South Hampton Roads HSR passenger service would have on changes in land use patterns is anticipated to be minimal. Station development or redevelopment and grade crossing studies would be conducted with local and state agency planners to ensure compatibility with existing plans. No adverse land use impacts are anticipated from the proposed undertaking.

Some communities could benefit from the proposed HSR passenger service because no rail passenger service presently operates between Richmond and South Hampton Roads. The activation of HSR passenger service could alter the approach to long-term land use planning in some communities to spur development and increase redevelopment.

2.4.3 Population

Population data for the HSR corridor were collected from the U.S. Census Bureau and were supplemented by information contained in the *Tier I DEIS for the Southeast Corridor High Speed Rail; Washington D.C. to Charlotte, NC* (August 8, 2001). These data were sorted by county and towns and compiled into two tables.

There are 11 counties/cities and 4 towns located along the proposed HSR corridor. The population of each county/city and town is listed in Table 2-1, which also provides a comparison of 2000 population data to 1990 population data, indicated by the percent growth and or percent decrease over that 10-year period. The most populated areas along the proposed HSR corridor are Chesterfield County and the city of Richmond at the northwestern terminus and the cities of Chesapeake and Norfolk at the southeastern terminus. The corridor from Prince George County through and including Isle of Wight County is rural in character, with a population relatively dispersed over a large area.

Table 2-1
Population for Cities, Counties, and Selected Towns along the HSR Corridor

County/City/Town	2000 Population	1990 Population	Percent Change 1990-2000
City of Richmond*	189,700	203,056	-6.6
Chesterfield County*	253,365	209,274	21.1%
City of Colonial Heights*	16,235	16,064	1.1%
City of Petersburg*	34,398	38,386	-10.4%
Prince George County	33,047	26,206	20.7%
Sussex County	12,504	9,753	22.0%
Southampton County	17,482	17,010	2.7%
Isle of Wight County	29,728	24,169	18.7%
City of Suffolk	63,677	49,604	22.1%
City of Chesapeake	199,184	137,238	31.1%
City of Norfolk	234,403	261,319	-10.3%
Town of Waverly	2,309	2,223	3.9%
Town of Wakefield	1,038	1,070	-3.0%
Town of Ivor	320	1,025	-1.2%
Town of Windsor	916	324	-10.6%

^{*}Estimated 1999 population obtained from *Tier I DEIS* for the Southeast Corridor High Speed Rail; Washington D.C. to Charlotte, NC (August 8, 2001).

Collectively, the study area has experienced a total population growth of 8.47 percent based on the percent change from 1990 to 2000. In general, overall population totals in the study area increased from approximately 992,000 in 1990, to 1.08 million in 2000. Three cities experienced a decline in population during this period: Richmond, Petersburg, and Norfolk. Every town located along the rail line experienced a loss of population except for the Town of Waverly. The largest population growth was experienced in the city of Chesapeake.

A general breakout of population characteristics within the study area is provided in Table 2-2. In terms of ethnicity, the population along the corridor is primarily white, as 7 out of the 11 jurisdictions have a higher percentage of whites than other ethnic groups. Richmond, Petersburg, and Norfolk, and Sussex County have majority non-white populations. The Towns of Waverly and Wakefield also have non-white populations as the majority.

Richmond and Norfolk have the greatest number of households, with the average number of persons per household ranging from 2.25 in Richmond to 2.81 in Chesterfield County. Based on 1997 income statistics, median household incomes ranged from a low of \$25,428 in Petersburg to a high of \$55,324 in Chesterfield County, with an overall study area average of \$36,805. Richmond, Norfolk, and Wakefield had the highest percentage of persons at or below the poverty level.

2.4.4 Environmental Justice Populations

Over the past several decades, public concerns have increased over economic, racial, and ethnic fairness in the distribution of the environment and socioeconomic burdens of transportation projects, as well as the economic and mobility benefits derived from transportation projects. A series of federal legislation and policies have been implemented to respond to these concerns, specifically, Title VI of the Civil Rights Act and the Environmental Justice Executive Order (EO 12898) of 1994.

Definition of Environmental Justice

The term "environmental justice" as well as related terms "minority" and "low-income" are not explicitly defined in Executive Order 12898. The Executive Order states that environmental justice is achieved when the actions of Federal agencies impose no disproportionately high and adverse environmental effects on low-income and minority populations. Data sources for this analysis were gathered from the U.S. Census Bureau and focus specifically on minority and low-income populations. Information on median household incomes and percent of persons below the poverty level is contained in Table 2-2. Information relative to the racial composition of the population within the Richmond-South Hampton Roads HSR corridor, as well as the racial composition of the population of the Commonwealth of Virginia as a whole, is provided in Table 2-3.

In general, the population of the counties/cities along the proposed corridor is 58.1 percent white, 38.3 percent African American, 1.5 percent Hispanic, 0.16 percent American Indian, and 1.25 percent Asian or Pacific Islander. Compared to the Commonwealth of Virginia, the corridor has approximately 20 percent more African-Americans and approximately 12 percent fewer whites. There are approximately 3 percent fewer Hispanics along the corridor and approximately 2.5 percent fewer Asians and Pacific Islanders.

Table 2-2 Population Characteristics for Cities, Counties, and Selected Towns along the HSR Corridor

	Ethn	icity	A	\ge	Но	Housing		97 model- stimate
County/City	White (%)	Other (%)	Under 18 years (%)	65 years & older (%)	House- holds	Persons per household	Median household income (\$)	Percent below poverty
City of Richmond*	39.8	60.2	20.1	17.5	85,268	2.25	29,234	24.9
Chesterfield County*	81.9	18.1	29.0	5.6	73,665	2.81	55,324	6.4
City of Colonial Heights*	95.4	4.6	21.0	16.9	6,332	2.51	40,923	7.5
City of Petersburg*	24.4	75.6	23.0	17.1	14,664	2.48	25,428	25.6
Prince George County	60.9	39.1	25.1	7.3	10,159	2.76	44,845	9.1
Sussex County	36.4	63.6	19.6	13.4	4,126	2.41	27,489	21.0
Southampton County	56.0	44.0	22.7	14.2	6,279	2.53	33,943	17.1
Isle of Wight County	71.1	28.9	25.4	12.2	11,319	2.61	39,331	11.6
City of Suffolk	53.8	46.2	27.8	11.4	23,283	2.69	34,560	16.4
City of Chesapeake	66.9	33.1	28.8	9.0	69,900	2.79	45,427	10.1
City of Norfolk	48.4	51.6	24.0	10.9	86,210	2.45	28,350	24.4
Town of Waverly+	36.7	63.3	25.4	18.6	810	2.47	23,714	11.4
Town of Wakefield+	47.5	52.5	24.9	18.4	423	2.45	20,550	24.3
Town of Ivor+	76.3	23.7	20.0	21.6	139	2.37	24,821	13.6
Town of Windsor+	89.7	10.3	23.8	12.4	389	2.35	26,125	8.0

^{*} Estimated 1999 population characteristics obtained from *Tier I DEIS for the Southeast Corridor High Speed Rail; Washington D.C. to Charlotte, NC* (August 8, 2001). +Income data from 1990 Census.

County/City	White	African American	Hispanic	American Indian	Asian and Pacific Islander	Other
City of Richmond*	43.3%	55.4%	0.4%	0.2%	0.8%	0.3%
Chesterfield County*	84.7%	12.9%	0.7%	0.3%	1.9%	0.2%
City of Colonial Heights*	97.0%	0.4%	0.7%	0.0%	2.2%	0.4%
City of Petersburg*	26.5%	72.1%	0.3%	0.3%	0.8%	0.3%
Prince George County	59.1%	32.5%	4.9%	0.4%	1.9%	2.2%
Sussex County	36.3%	62.1%	0.8%	0.1%	0.1%	0.5%
Southampton County	55.8%	42.9%	0.7%	0.2%	0.2%	0.3%
Isle of Wight County	70.6%	27.1%	0.9%	0.3%	0.3%	0.3%
City of Suffolk	53.3%	43.5%	1.3%	0.3%	0.8%	0.4%
City of Chesapeake	65.9%	28.5%	2.0%	0.4%	1.9%	0.7%
City of Norfolk	47.0%	44.1%	3.8%	0.5%	2.9%	1.7%
Town of Waverly	36.7%	61.8%	1.2%	0.1%	0%	1.4%
Town of Wakefield	47.5%	51.3%	0.4%	0.2%	0%	1.1%
Town of Ivor	76.3%	19.7%	0%	1.3%	0%	2.7%
Town of Windsor	89.7%	9.1%	1.0%	0.4%	0%	0.8%
Commonwealth of Virginia 2000 Census	70.2%	19.6%	4.7%	0.3%	3.8%	2.0%

Table 2-3
Minority Populations for Cities, Counties, and Selected Towns along the HSR Corridor

Note: Percentages do not add up to 100% in most cases due to individuals reporting two or more races.

The most recent U.S. Census data (2000) for the corridor would have to be obtained at the block level for all census blocks immediately adjacent to the proposed right of way to conduct a specific environmental justice assessment. This information would then be compared to population and income statistics available for Virginia as a whole. The information contained in this section is provided as a general planning overview of the population characteristics in the study area and is not intended to be an environmental justice analysis for this project. However, two towns located along the proposed alignment on Route 460 have large concentrations of minority populations: Waverly and Wakefield. Any disproportionate impacts to these communities would have to be mitigated as the project moved into the design phase. Of particular concern are impacts to the Waverly community, since the rail line is located in close proximity to residents who could experience noise increases and are most likely environmental justice populations.

2.5 COMMUNITY FACILITIES AND SERVICES

Existing community facilities, including schools, religious institutions, cemeteries, hospitals, civic centers, police and fire stations, airports, parks and recreational areas, and bus terminals, were identified along the proposed HSR corridor. The locations of existing facilities were determined

^{*} Estimated 1999 minority populations obtained from *Tier I DEIS for the Southeast Corridor High Speed Rail; Washington D.C. to Charlotte, NC* (August 8, 2001).

using the GIS database developed from ESRI data, as well as ADC maps for certain portions of the corridor. The type of each community facility and its location in relation to the HSR alignment are listed in Table 2-4. All community facilities included in the GIS database are illustrated on the large environmental constraints maps prepared for this study.

Table 2-4
Community Services and Facilities Within 300 Feet of the HSR Alignment

#	Name	County/City/Locale	Approximate Distance From HSR Alignment	Notes						
Scl	Schools									
1	Lakeview School	Chesterfield County	300 feet west	Along Ettrick Connection.						
2	Suffolk High School	City of Suffolk	275 feet south							
3	West School	City of Norfolk	200 feet west							
Re	ligious Institutions									
1	Faith Baptist Church	City of Colonial Heights	150 feet east	Along Dunlop Connection.						
2	First Baptist Church Disputanta	Prince George County	200 feet east (estimated)	Observed during fieldwork.						
3	Bethany Presbyterian Church	Isle of Wight	250 feet east							
4	Missouri Church	City of Suffolk	130 feet north							
5	Bethlehem Christian Church	City of Suffolk	270 feet south							
6	United Methodist Church	City of Chesapeake	100 feet north (estimate)	Observed during fieldwork.						
Се	meteries									
1	Blandford Cemetery	City of Petersburg	Easternmost border abuts HSR right of way	30,000 Confederate Soldiers buried here. Site of first Memorial Day celebration.						
2	Sacred Heart Cemetery	Prince George County	125 feet west							
3	Town of Windsor Cemetery	Isle of Wight County	265 feet southwest							
4	Tyler Cemetery	Isle of Wight County	125 feet southwest							
5	Mount Olive Cemetery	City of Norfolk	265 feet west							
Air	ports									
1	Hampton Roads Airport	City of Suffolk	300 feet north	Southern tip of property falls within buffer.						
Laı	ndmarks									
1	Mayo's Island	City of Richmond	HSR right of way crosses eastern portion of island	Existing bridge over island.						
2	Defense General Supply Center	Chesterfield County	Eastern-most tip of landmark falls within 300' HSR right of way buffer	Located predominantly west of HSR right of way.						

Table 2-4
Community Services and Facilities Within 300 Feet of the HSR Alignment

#	Name	County/City/Locale	Approximate Distance From HSR Alignment	Notes
3	Petersburg National Battlefield	City of Petersburg	HSR right of way bisects western-most section of Battlefield	Predominantly east of right of way. Existing railroad between battlefield and historic Blandford Cemetery.
4	Cemetery	Prince George County	Small cemetery east of right of way, almost entirely within 300' buffer	Unnamed in GIS database.
Pa	rks and Recreational Areas			
1	Petersburg National Battlefield	City of Petersburg	Westernmost section of park is bisected by HSR right of way	Southwestern portion of battlefield is designated a public park.

Sources: GIS Database provided by Parsons Transportation Group, Inc. and the most recent ADC mapping for the study area cities and counties.

In addition to the schools identified within 300 feet of the proposed HSR right of way, three schools are located just beyond the 300-foot buffer:

- Thomas Jefferson Elementary School, Suffolk, approximately 375 feet south of proposed HSR right of way.
- Paul D. Camp Community College, Suffolk, approximately 375 feet north of proposed HSR right of way.
- Ruffner Junior High School, Norfolk, approximately 360 feet west of proposed HSR right of way.

In addition to the religious institutions identified within 300 feet of the proposed HSR right of way, the following religious institutions are located just beyond the designated 300-foot buffer:

- Saint Michael's Episcopal Church, Colonial Heights, approximately 335 feet east of the proposed HSR right of way (Dunlop Connection).
- Sacred Heart Church, Prince George County, approximately 450 feet east of proposed HSR right of way.
- Saint Paul's Baptist Church, Suffolk, approximately 325 feet north of proposed HSR right of way.
- Saint Mary's Church, Chesapeake, approximately 460 feet south of proposed HSR right of way.

According to the GIS database and ADC maps, there are no state capitols, municipal courthouses, town halls, libraries, municipal auditoriums, county jails, police stations, fire/rescue stations, or hospitals within 300 feet of the proposed HSR right of way. Several of these community resources and facilities are located in the general vicinity of the HSR right of way but none will be adversely affected by the proposed project.

There are no hospitals or bus/transportation terminals within 300 feet of the proposed HSR right of way.

2.6 PARKS, RECREATION AREAS, AND WILDLIFE REFUGES

Other than the Petersburg National Battlefield Park, there are no other public or private parks or recreational areas within 300 feet of the HSR right of way. There are two golf courses in close proximity to the right of way, the Prince George Golf Course, located west of the right of way in Disputanta, and the Suffolk Golf Course, located south of the right of way in Suffolk. An athletic field is located west of the proposed Dunlop Connection in Colonial Heights, north of the Appomattox River. The Great Dismal Swamp National Wildlife Refuge (NWR) is the only national wildlife refuge located within 300 feet of the right of way.

The right of way of the proposed HSR service passes through the western section of the Petersburg National Battlefield, located in the northeastern portion of Petersburg. A portion of the battlefield is also located in Prince George County. The battlefield commemorates the Civil War battles in 1864 and 1865 that resulted in the failure of General Ulysses S. Grant to capture Richmond. The southwestern portion of the battlefield is designated as a public park.

The right of way of the proposed HSR service passes through the northern portion of the Great Dismal Swamp NWR, which encompasses portions of Suffolk and Chesapeake. The HSR service would operate on an existing railroad along the boundary of the refuge and would not displace of any portion of the NWR. Although the wetlands and other habitats in the refuge would not be directly affected by the operation of HSR, increased noise and vibration could disturb nearby wildlife populations. Due to the infrequency of the noise and vibration associated with HSR, these impacts are expected to be low.

2.7 NOISE

Passenger trains generally travel through or near populated areas, making evaluating noise and vibration a key part of the environmental impact assessment process. Noise and vibration are often major concerns of surrounding communities.

The Federal Railroad Administration (FRA) and the Federal Transit Administration (FTA) have developed guidance manuals that include criteria for noise and vibration impact evaluation, High-Speed Ground Transportation Noise and Vibration Impact Assessment and Transit Noise and Vibration Impact Assessment. The FTA classifies receptors according to three categories; each is based on land use. Category 1 includes areas where quiet is an essential element of their intended purpose, such as concert pavilions or national landmarks. Category 2 includes residences and buildings where people sleep, while Category 3 includes institutional land uses with daytime and evening uses, such as schools, places of worship, and libraries.

There are six places of worship, five cemeteries, four landmarks, three schools, and one park located within the 300-foot buffer that may be affected by noise and vibration. Additional information for each of these sites is provided in Table 2-4.

2.8 AIR QUALITY

In accordance with the Clean Air Act and the 1990 Clean Air Act Amendments, all regulatory regions are classified as either attainment or non-attainment areas. The classifications are based on adherence to National Ambient Air Quality Standards (NAAQS) established by the EPA. States are required to develop State Implementation Plans intended to maintain and enforce NAAQS within each air quality region.

Five municipalities along the HSR corridor are designated as ozone maintenance areas. Maintenance areas are classified as being in attainment of clean air standards, but subject to the state maintenance plan. The five maintenance areas include Chesterfield County and the cities of Richmond, Suffolk, Chesapeake, and Norfolk. The proposed HSR project is expected contribute to the region's long-term attainment of clean air goals by reducing overall vehicle emissions. However, a quantitative analysis of the affect of the proposed HSR service on regional and local air quality has not been conducted. A more detailed air quality analysis would be required for future environmental documentation.

2.9 WATERS, WETLANDS, AND FLOODPLAINS

2.9.1 Surface Waters

Surface waters in the vicinity of the HSR corridor were mapped using GIS data from ESRI and National Wetland Inventory (NWI) mapping. The study area encompasses portions of the following four watersheds, as defined by the USGS: Lower James River, Appomattox River, Blackwater River, and Hampton Roads. The Lower James River, Appomattox, and Hampton Roads watersheds are part of the James River Basin and the larger Chesapeake Bay Watershed. The Blackwater River watershed is part of the Chowan and Dismal Swamp Basin. The proposed HSR service would cross 29 named, perennial streams between Richmond and Norfolk. Stream crossings in each watershed are listed below:

- Lower James River Watershed: James River, Goose Creek, Falling Creek, Kingsland Creek, and the North Great Branch and the South Great Branch of Proctors Creek.
- **Appomattox River Watershed:** Ashton Creek, Timsbury Creek, Swift Creek, Oldtown Creek, Appomattox River, and Poor Creek.
- Blackwater River Watershed: Blackwater Swamp, Second Swamp, Warwick Swamp, Spring Branch, Coppahaunk Swamp, Tucker Swamp, Blackwater River, Burnt Mill Swamp, and Antioch Swamp.
- Hampton Roads Watershed: Eley Swamp, Cohoon Creek/Lake Meade, Lake Kilby, Shingle Creek, Southern Branch Elizabeth River, Gilligan Creek, Jones Creek, and Eastern Branch Elizabeth River.

Major river crossings along the corridor include the James River in Richmond, the Appomattox River in Petersburg, the Blackwater River at the border of Southampton and Isle of Wight counties, and the Southern and Eastern Branches of the Elizabeth River in Norfolk. Because no additional infrastructure would be required at these crossings to operate HSR, neither HSR alternative would adversely affect these surface waters.

The Ettrick Connection would require a new bridge to cross the Appomattox River. This bridge would be constructed within the 6.2-mile segment of the Appomattox River that is designated as a State Scenic River (from the base of the Lake Chesdin Dam to the Route 36 bridge crossing

in Petersburg). Construction of the bridge could permanently alter historic districts and floodplains along the river and could temporarily affect aquatic life and habitats. The Dunlop Connection would cross the Appomattox River east of the Route 36 bridge and outside the boundaries of the State Scenic River designation. However, the old Atlantic Coast Line Railroad bridge over the Appomattox would need to be rebuilt for the Dunlop Connection. This construction could also impair floodplains and degrade aquatic habitats. Further investigation would be necessary to determine the nature and degree of these effects.

2.9.3 Wetlands

The locations and classifications of wetlands within the 300-foot buffer of the HSR alignments were established using NWI maps, which are generally used for planning purposes only. Field surveys were not conducted to verify this mapping. The wetland system descriptions used in this report are from Cowardin et al. (1979).

The buffers for each alternative encompass more than 575 acres of palustrine, estuarine, riverine, and lacustrine wetlands. Palustrine wetlands include all non-tidal wetlands dominated by trees, shrubs, persistent emergent plants, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand (ppt). Estuarine wetlands consist of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land, but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from land. Riverine wetlands include all wetlands and deepwater habitats contained within a channel, with the exception of wetlands dominated by persistent vegetation and habitats with salinity greater than 0.5 ppt. Lacustrine wetlands include wetlands and deepwater habitats that are situated in a topographic depression or a dammed river channel. Wetlands in this classification lack trees, shrubs, persistent emergent plants, emergent mosses or lichens, and occupy more than 20 acres (8 hectares) in area.

Most wetlands located within the 300-foot buffer of the HSR right of way, for both the Ettrick and Dunlop Connections, are non-tidal, palustrine forested wetlands, or freshwater swamps. These areas account for approximately 60 percent of the wetlands within the right of way buffer, and other palustrine wetlands account for an additional 20 percent of that total area. Approximately 15 percent of the wetland area within the HSR right of way buffer is actually occupied by waters that are included in the classifications for estuarine, lacustrine, and riverine wetlands. The remaining 4 percent of the wetland area consists of estuarine emergent wetlands, estuarine scrub-shrub wetlands, and estuarine shore. Wetlands are located throughout the corridor, primarily along larger streams and rivers. The area occupied by these various wetland systems within the buffers of the HSR alternatives is summarized in Table 2-5. Wetlands in the Great Dismal Swamp occupy the large undeveloped area between Suffolk and Chesapeake, but much of the area of the swamp lies outside the 300-foot buffer for the corridor. A small portion of the Hampton Roads Wetland Mitigation Bank is also adjacent to the right of way near the proposed Sunray station, but no direct impacts to the mitigation bank are anticipated.

The 300-foot buffer for the Ettrick Connection alternative encompasses 7.8 additional acres of riverine wetlands compared to the alternative for the Dunlop Connection. The Ettrick Connection would extend father along the banks of the Appomattox River than the Dunlop Connection. The presence of wetlands within the 300-ft buffer surrounding the right of way does not imply that all or part of these areas would be affected by the construction and implementation of HSR. HSR service would operate on existing railroad tracks, or on new tracks constructed within the existing railroad right-of way. Because major improvements to

bridges and culverts are not anticipated as part of HSR implementation, wetlands adjacent to the right-of way are not likely to be disturbed.

Table 2-5
Existing Wetlands Within 300 Feet of the HSR Corridor Alternatives

	Dunlop	Connection	Ettrick Connection			
Wetland System	Area (ac)	Percent of Total	Area (ac)	Percent of Total		
Total Estuarine	62.6	11	62.6	11		
Total Lacustrine	27.2	5	27.2	5		
Total Palustrine	461.3	80	460.6	79		
Total Riverine	25.6	4	34.0	6		
Total Wetlands	576.6	100	584.4	100		

2.9.4 Floodplains

In cooperation with state and local governments, FEMA has developed flood boundary and flood insurance mapping. In accordance with Executive Order 11988 – Floodplain Management, floodplains and regulatory floodways within the study area were identified using the *Flood Insurance Study* and associated mapping for the corridor. Since not all local governments within the study area participate in FEMA's National Flood insurance Program (NFIP), only limited information was available for some areas. Many rural communities in southern Virginia do not participate in the program. Floodplain mapping was not electronically available for any locations within the study area, with the exception of Norfolk, and is therefore not illustrated on the environmental constraints mapping. Floodplain mapping also was not readily available for the Colonial Heights segment of the HSR corridor, where the alternatives take different paths.

The NFIP defines a floodplain as any land area susceptible to being inundated by water. The floodplain includes both the floodway and the floodway fringe. The floodway is defined as the channel of the stream and adjacent floodplain area that should be kept free of any encroachment so that a 100-year flood event may occur without increasing the level and extent of base flood elevations. The base, or 100-year flood, is defined as an event that is equaled or exceeded, on average, once every hundred years. The floodway fringe, or the 100-year floodplain, is the area between the floodway boundary and the outer limits of the 100-year floodplain boundary.

Throughout the study area, 100-year floodplains are found adjacent to most of the major surface waters and some of the smaller tributaries. These include the James River, Appomattox River, Blackwater River, and Southern Branch of Elizabeth River. In total, the HSR corridor would cross 27 mapped floodplains between Richmond and Norfolk. From preliminary analysis, both alternatives would be located within floodplain boundaries. More detailed engineering design is needed to determine the extent of interaction with floodplains.

2.10 WILDLIFE AND HABITATS

2.10.1 Federal and State-Listed Species

Based on searches of the Fish and Wildlife Information Service (FWIS) of the Virginia Department of Game and Inland Fisheries (VDGIF), 34 animal species with endangered, threatened, or special concern status have been documented to occur within 3 miles of the proposed HSR right of way from Richmond to Norfolk. The Division of Natural Heritage (DNH) in the Virginia Department of Conservation and Recreation also publishes county lists of threatened and endangered plant and animal species and unique ecological communities. One federally listed plant species is documented in Chesterfield County. Counties along the HSR corridor contain 19 unique ecological communities, and 2 known bird-nesting sites. The DNH county lists of federal and state-listed animal species were not used to assess the potential for species to occur within the HSR corridor. The FWIS database was searched using multiple locations along the corridor, in order to obtain more detailed records for threatened and endangered species.

Sensitive joint-vetch (*Aeschynomene virginica*) is the only plant species with federal or state status with known to occur in the cities and counties encompassing the HSR corridor. *A. virginica* is listed as federally threatened and has been documented in Chesterfield County. The habitat for this species is described by the U.S. Fish and Wildlife Service (FWS) as the intertidal zone where plants are flooded twice daily, plant diversity is high (50 species per acre), and annual species predominate. Suitable habitat for this species may exist along the tidal portions of the James River, Swift Creek, and the Appomattox River, but these areas are generally located east of the HSR right of way, far outside the 300-foot buffer.

A complete list of threatened, endangered, and rare animal species for each location searched along the HSR corridor is provided in Appendix A. Of the 34 animal species identified in the FWIS database as having the potential to be affected by the HSR alignment, the red-cockaded woodpecker (*Picoides borealis borealis*) is listed as federally endangered, the piping plover (*Charadrius melodus melodus*) and bald eagle (*Haliaeetus leucocephalus leucocephalus*) are listed as federally threatened, and 4 species are listed as federal species of concern. The bald eagle is also a state-endangered species. Of the federal species of concern, the eastern bigeared bat (*Corynorhinus rafinesquii macrotis*) and Henslow's sparrow (*Ammodramus henslowii susurrans*) are also listed as state-endangered and state-threatened, respectively. A third state-endangered species found within 3 miles of the proposed right of way is the blackbanded sunfish (*Enneacanthus chaetodon*). In addition, four other state-threatened species have been documented to occur within 3 miles of the right of way: Mabee's salamander (*Ambystoma mabeei*), peregrine falcon (*Falco peregrinus*), loggerhead shrike (*Lanius ludovicianus ludovicianus ludovicianus*), and Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*).

The FWIS records do not indicate the exact location of the species and do not necessarily mean that the species would occur even within 300 feet of the rail line. Nonetheless, the presence of any threatened or endangered animal species is not considered a fatal flaw, because the HSR service is unlikely to alter the availability of suitable habitat.

2.10.2 Fisheries Issues

The National Marine Fisheries Service was consulted to determine the presence or absence of Essential Fish Habitat (EFH) in the vicinity of the proposed right of way. EFH refers to the habitats of marine, estuarine, and anadromous finfish, mollusks, and crustaceans, which are

broadly defined in the 1996 amendments to the Magnuson-Stevens Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The corridor does not encompass any areas with EFH designations, but the nearby James River estuary is designated as EFH for several species. Within the James River estuary, the EFH is designated in the mixing water/brackish salinity zone (0.5 percent < salinity < 25.0 percent) for juveniles and adults of the following species: windowpane flounder (*Scopthalmus aquosus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), summer flounder (*Paralicthys dentatus*) (designation includes larvae), and black sea bass (*Centropristus striata*).

2.10.3 General Habitats

Habitats along the HSR corridor were characterized based on field observations of land use and vegetation cover types. Detailed habitat surveys were not conducted, but NWI maps and digital aerial photos of the study area were used to develop general descriptions of fields, forests, and wetlands located along the corridor.

Habitats along more rural portions of the corridor primarily consist of dry pine forests, open agricultural fields, and forested wetlands. Forested areas, many of which are classified as wetlands, tend to be concentrated along large river systems and their smaller tributaries. These fields, pine forest, and swamps are fairly evenly distributed along the HSR corridor, interrupted only by the development associated with small towns such as Disputanta, Waverly, Wakefield, and Windsor. The Great Dismal Swamp NWR, located between Suffolk and Chesapeake, contains the largest expanse of wildlife habitat along the corridor, most of which is forested. The potential impacts to these habitats are estimated to be low, because implementation of the proposed project would not displace forested areas or fields.

Wildlife habitats in urban and suburban areas, particularly in the cities of Richmond and Petersburg, are very limited due to the density of commercial, residential, and industrial development. The natural areas that remain are typically fragmented by development and degraded by the proximity of noisy highways. The potential impacts to these urban and suburban habitats are expected to be low. The highest quality habitats in these cities are located along the banks of the James and Appomattox Rivers. Because these rivers are already bridged, operating HSR service across them is not expected to degrade their wildlife benefits. The landscape of Norfolk is also very urban, but it offers relatively high-quality habitat for many coastal species due to its location at the intersection of several river systems and its proximity to the Chesapeake Bay estuary. At the crossing of the Eastern Branch of the Elizabeth River, the proposed HSR service also would operate on existing movable bridges, which would not be modified by any of the alternative service levels. HSR operations through Chesapeake and Norfolk are not expected to significantly alter the quality or availability of existing wildlife habitats. While the increased noise and frequency of trains passing through any habitat could potentially degrade its quality, the effect would be temporary and would not represent a fatal flaw for HSR service.

2.10.4 Unique Habitats

Based on DNH records, no unique ecological communities are found in the cities of Richmond, Petersburg, or Norfolk, and the only unique community found in Chesterfield County is a tidal freshwater marsh. Communities found in Prince George County include coastal plain bottomland hardwoods, coastal plain depression pond, and tidal freshwater marsh. Sussex and Southampton counties contain several unique communities, including bald cypress-tupelo swamp, basic mesic forest, coastal plain bottomland hardwoods, fluvial terrace woodlands,

mesic mixed hardwood forest, and pine/scrub oak sandhill. Other ecological communities, such as coastal plain wet meadow, coastal plain/piedmont acidic seepage swamp, high pocosin, loblolly pine forest, non-riverine pine - hardwood forest, oxbow pond, peatland Atlantic white cedar forest, pond pine forest/woodland, streamhead Atlantic white cedar forest, tidal baldcypress woodland/savanna, tidal oligohaline marsh are also found in Sussex, Southampton, Isle of Wight, Suffolk, and Chesapeake. More information on the locations of these communities within each city and county would be necessary to evaluate how HSR operations would affect them.

Additionally, DNH manages several natural area preserves in southeastern Virginia, including Dendron Swamp Natural Area Preserve, Blackwater Ecological Preserve, and Antioch Pines Natural Area Preserve. Because these preserves are generally located in undeveloped areas, away from population centers, they are sufficiently removed from the HSR right of way that they would not be affected.

2.11 HISTORIC AND ARCHAEOLOGICAL RESOURCES

2.11.1 Overview

During the nineteenth century, the advent of railroad transportation enhanced the feasibility of the development of commercial centers inland, away from rivers and ports. In Virginia, numerous nineteenth-century towns were established and prospered due to the textile and tobacco industries and their proximity to rail lines. Therefore, many historic properties, districts, and archaeological sites are likely to be found along the proposed corridor.

The available GIS database and ADC mapping used to conduct the preliminary environmental screening analysis contained very little information pertaining to cultural resources for the project corridor. Therefore, an Internet search was conducted at www.nr.nps.gov, a site maintained by the National Parks Service (NPS), to identify the presence of any listed or eligible National Register historic properties, districts or archaeological sites within the study area. However, to thoroughly and accurately identify the presence of cultural resources along the proposed HSR corridor, a detailed research effort would be necessary and would involve consultation with the Virginia Department of Historic Resources (VDHR) in Richmond and a detailed review of existing files maintained at that location. Therefore, the information provided below is solely for the purpose of providing a general overview as to the potential for cultural resources along the proposed HSR corridor.

2.11.2 Richmond

Established in 1737, Richmond supports a rich political, architectural, and military history. Richmond replaced Williamsburg as the capital of Virginia in 1779 and was the capital of the Confederacy during the Civil War. Richmond contains several historic neighborhoods, eighteenth- and nineteenth-century town homes, Victorian homes, neo-classical architecture, and various historic churches, monuments, and landmarks. The city contains several National Historic Landmarks. Richmond's Main Street Station, now undergoing restoration, is listed on the National Register of Historic Places (NRHP). Presently, passenger trains do not stop at Main Street Station, although Amtrak service to Newport News uses the easternmost station tracks. The City of Richmond is working with Amtrak and the DRPT to re-institute rail passenger service into and through the station, with the station serving as the hub of the HSR passenger service to Norfolk, Virginia and Charlotte, North Carolina.

2.11.3 Chesterfield County

Review of the GIS database, ADC maps, and the NPS internet site revealed that there are no sites listed or eligible for the NRHP, historic districts, or archaeological sites within 300 feet of the proposed HSR right of way in Chesterfield County.

2.11.4 Colonial Heights

Review of the GIS database, ADC maps, and the NPS internet site revealed that there are no sites listed or eligible for the NRHP, districts, or archaeological sites within 300 feet of the proposed HRS right of way in Colonial Heights.

2.11.5 Petersburg

Petersburg is home to several historic sites, including the Petersburg National Battlefield, the Old Towne Historic District, and several eighteenth- and nineteenth-century structures. The proposed Ettrick Connection would pass directly through the Old Towne Historic District along the southern shore of the Appomattox River. Farther to the southeast, the HSR right of way would pass through the western section of the Petersburg National Battlefield, the site of the longest siege in American history in which General Ulysses S. Grant failed to capture Richmond in 1864 and 1865. The rail line actually serves as the eastern boundary of the Blandford Cemetery, a site where approximately 30,000 Confederate soldiers are buried and where the first Memorial Day was observed. The railroad through this area is presently active, accommodating frequent freight movements associated with the coal export industry in Norfolk.

Also of note in Petersburg is the island of Pocahontas, located just east of the Dr. Martin Luther King, Jr. Memorial Bridge that carries U.S. Route 1 over the Appomattox River. According to Delaney Ward of the City of Petersburg, Pocahontas is historically significant, but to date has not been listed on the National Register of Historic Places. Although there has been much alteration to the housing on the island, there is some justification for a sympathetic assessment because of damage incurred in a hurricane in 1993. The island's street network was laid out in 1752, and the island was incorporated into Petersburg in 1784. It was one of the first African-American settlements in the country.

In comparing the Dunlop Connection and the Ettrick Connection, both have the potential for interaction with cultural resources. The Dunlop Connection would include new tracks that would be provided for trains southbound to Florida. It appears that this construction would be within the boundaries of the Battersea Historic District. More detailed design information and a comprehensive cultural resources analysis are needed to determine the affect of the proposed HSR service on this historic district and the Pocahontas neighborhood.

2.11.6 Prince George County

Review of the GIS database, ADC maps, and the NPS internet site revealed that there are no sites listed or eligible for the NRHP, districts, or archaeological sites within 300 feet of the proposed HRS right of way in Prince George County.

2.11.7 Sussex County

Review of the GIS database, ADC maps, and NPS internet site revealed that there is one site listed on the NRHP that is near the proposed HSR right of way, although it cannot be determined from the address whether the site falls within the 300-foot buffer used for the

environmental screening analysis. The site is the Miles B. Carpenter House located along U.S. Route 460 in Waverly, and it was listed on the NRHP on November 13, 1989. There are no historic districts or archaeological sites within 300 feet of the proposed HRS right of way in Sussex County, according to the data resources consulted.

2.11.8 Southampton County

Review of the GIS database, ADC maps, and NPS internet site revealed that there are no listed or eligible National Register historic properties, districts, or archaeological sites within 300 feet of the proposed HRS right of way in Southampton County.

2.11.9 Isle of Wight County

Review of the GIS database, ADC maps, and NPS internet site revealed that there are no listed or eligible National Register historic properties, districts, or archaeological sites within 300 feet of the proposed HRS right of way in Isle of Wight County.

2.11.10 Suffolk

Review of the GIS database, ADC maps, and NPS internet site revealed that there is one site listed on the NRHP that is near the proposed HSR right of way, although it cannot be determined from the address whether the site falls within the 300-foot buffer used for the environmental screening analysis. The site is a professional building located at 100 North Main Street in Suffolk, and it was listed on the NRHP on August 12, 1999. There are no historic districts or archaeological sites within 300 feet of the proposed HRS right of way in Suffolk, according to the data resources consulted.

2.11.11 Chesapeake

Review of the GIS database, ADC maps, and NPS internet site revealed that there are no listed or eligible National Register historic properties, districts, or archaeological sites within 300 feet of the proposed HRS right of way in the city of Chesapeake.

2.11.12 Norfolk

Review of the GIS database, ADC maps, and NPS internet site revealed that there are no listed or eligible National Register historic properties, districts, or archaeological sites within 300 feet of the proposed HRS right of way as it passes through the southern section of Norfolk, south of the Eastern Branch of the Elizabeth River. The Berkley North Historic District, a National Register district roughly bounded by Bellamy Avenue on the north, Pescara Creek on the east, Berkley Avenue on the south and Interstate 464 on the west, is located just west of the proposed HSR right of way but beyond the 300 foot buffer used in this environmental screening analysis.

2.12 HAZARDOUS WASTE SITES

The EPA has defined hazardous waste as any waste material (or combination of waste materials) that may pose a hazard to human health, welfare, or the environment. Such wastes are characterized as possessing reactive, toxic, infectious, explosive, flammable, corrosive, or radioactive qualities. Hazardous waste sites include, but arte not limited to landfills, dumps, pits, lagoons, salvage areas, and storage tanks. Information on documented hazardous waste

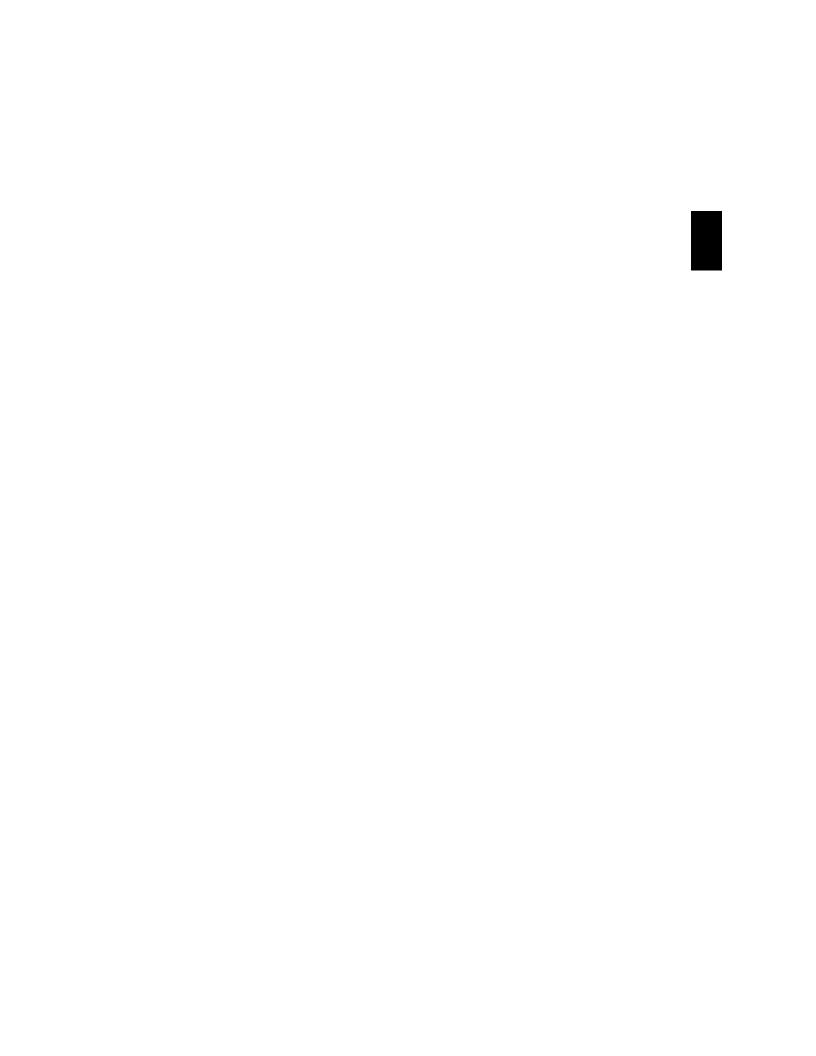
sites within the study was obtained from the EPA Comprehensive Environmental Response Compensation and Liability Act (CERCLA) information System (CERCLIS), which tracks sites with the potential to release hazardous substances into the environment. This database included 16 hazardous waste sites that are located within 2 miles of the proposed HSR right of way. With six sites located near the right of way, Richmond has the highest concentration of sites. Three sites are near the right of way in Chesapeake, two in Chesterfield County, and one site each is near the right of way in Colonial Heights, Petersburg, Sussex County, Suffolk, and Norfolk.

In Chesapeake, St. Julians Creek Annex (U.S. Navy) is located on 490 acres of land adjacent to the HSR right of way, immediately south of the boundary between the cities of Portsmouth and Chesapeake. The property extends west to Brentwood, south to St. Julians Creek, and east to the South Branch of the Elizabeth River. Current facilities at St. Julians Creek Annex include administrative offices, light industrial shops, and storage facilities for tenant naval commands, but the property has been used for various military purposes since 1849, including ordnance and material storage and ammunition supply. Waste from former operations was deposited onsite, creating numerous sources of potential contamination (Source: Superfund NPL Assessment Program (SNAP) Database). More information would be necessary to determine the precise locations of contamination on this property and the proximity of contamination to the HSR right of way.

2.13 PUBLIC SAFETY

Implementation of the HSR line would affect traffic flow near at-grade road crossings. At-grade crossings with high traffic volumes would be considered for grade separation. The GIS database and ADC maps show the number of grade crossings to differ slightly for the two alignments. A route using the Dunlop Connection would have 98 at-grade crossings, while a route using the Ettrick Connection would have 101. The total number of roadway crossings, including above-, below- and at-grade, would range from 129 to 133 for the Dunlop and Ettrick Connections respectively.

Additionally, increased vehicular and pedestrian traffic would be expected at transit stations. Control measures at stations, pedestrian crossings, and intersections would include various combinations of signs, signals, gates, pavement markings, and crosswalks.



Federal and State Endangered, Threatened, and Species of Special Concern Documented Within 3 Miles of the HSR Right of way

	,					1					
Common Name	Scientific Name	Status	Richmond	Petersburg	Disputanta	Waverly	Wakefield	Zuni	Kilby	Chesapeake	Norfolk
Amphibians and Reptiles											
Salamander, Mabee's	Ambystoma mabeei	ST						Υ			
Frog, carpenter	Rana virgatipes	SS					Υ				
Terrapin, northern diamond-backed	Malaclemys terrapin terrapin	FS									Υ
Birds											
Sparrow, saltmarsh sharp-tailed	Ammodramus caudacutus diversus	SS								Υ	Υ
Sparrow, Henslow's	Ammodramus henslowii susurrans	FSST									Υ
Egret, great	Ardea alba egretta	SS	Υ	Υ	Υ	Υ	Υ			Υ	Υ
Finch, purple	Carpodacus purpureus	SS		Υ						Υ	Υ
Thrush, hermit	Catharus guttatus	SS		Υ						Υ	Υ
Creeper, brown	Certhia americana	SS		Υ						Υ	Υ
Plover, piping	Charadrius melodus melodus	FT								Υ	Υ
Harrier, northern	Circus cyaneus	SS		Υ						Υ	Υ
Wren, sedge	Cistothorus platensis	SS		Υ						Υ	Υ
Heron, little blue	Egretta caerulea caerulea	SS				Υ	Υ				Υ
Heron, tricolored	Egretta tricolor	SS									Υ
Falcon, peregrine	Falco peregrinus	ST								Υ	Υ
Moorhen, common	Gallinula chloropus cachinnans	SS		Υ							Υ
Eagle, bald	Haliaeetus leucocephalus leucocephalus	FTSE		Υ					Υ	Υ	Υ
Shrike, loggerhead	Lanius Iudovicianus Iudovicianus	ST		Υ		Υ				Υ	Υ
Rail, black	Laterallus jamaicensis	FS								Υ	Υ
Crossbill, red	Loxia curvirostra	SS									Υ
Night-heron, yellow-crowned	Nyctanassa violacea violacea	SS								Υ	Υ
Pelican, brown	Pelecanus occidentalis carolinensis	SS									Υ

Federal and State Endangered, Threatened, and Species of Special Concern Documented Within 3 Miles of the HSR Right of way

Common Name	Scientific Name	Status	Richmond	Petersburg	Disputanta	Waverly	Wakefield	Zuni	Kilby	Chesapeake	Norfolk
Woodpecker, red-cockaded	Picoides borealis borealis	FE				Υ	Υ			Υ	Υ
Kinglet, golden-crowned	Regulus satrapa	SS		Υ						Υ	Υ
Nuthatch, red-breasted	Sitta canadensis	SS		Υ						Υ	Υ
Dickcissel	Spiza americana	SS									Υ
Tern, least	Sterna antillarum	SS									Υ
Tern, Caspian	Sterna caspia	SS									Υ
Tern, Forster's	Sterna forsteri	SS		Υ						Υ	Υ
Wren, winter	Troglodytes troglodytes	SS		Υ						Υ	Υ
Owl, barn	Tyto alba pratincola	SS	Υ	Υ							Υ
Fish											
Sunfish, blackbanded	Enneacanthus chaetodon	SE			Υ	Υ					
Mammals											
Bat, eastern big-eared	Corynorhinus rafinesquii macrotis	FSSE					Υ				
Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri	ST						Υ			
	TOTAL SPECIES DOCUMENTED	34	2	14	2	5	5	2	1	18	29

Status	Translation	Status	Translation
FE	Federal Endangered	SE	State Endangered
FT	Federal Threatened	ST	State Threatened
FP	Federal Proposed	SS	State Special Concern
FC	Federal Candidate	SC	State Candidate
FS	Federal Species of Concern		

No.	Roadway Name	County/City	Type of Crossing*	Notes
1	Main St	Richmond	Above-Grade	
2	Dock St	Richmond	Above-Grade	
3	State Hwy 195 (Downtown Expressway)	Richmond	Above-Grade	
4	Maury St	Richmond	At-Grade	
5	Connecting Rd	Richmond	Above-grade	Connector to I-95 from the west
6	Gordon Ave.	Richmond	Below-Grade	
7	Goodes St	Richmond	At-Grade	
8	Unnamed Road	Richmond	At-Grade	
9	Commerce Rd	Richmond	At-Grade	
10	Lumkin Ave.	Richmond	At-Grade	
11	Ruffin Rd	Richmond	Above-Grade	
12	Bells Rd	Richmond	At-Grade	
13	Dale Ave	Richmond	At-Grade	
14	Cogbill Rd	Chesterfield	Below Grade	
15	State Hwy 150 (Chippenham Pkwy)	Chesterfield	Above-Grade	
16	Station Rd	Chesterfield	At-Grade	
17	Marina Dr	Chesterfield	At-Grade	
18	Elliham Ave	Chesterfield	Above-Grade	
19	U.S. Hwy 1 (U.S. Hwy 301)	Chesterfield	Above-Grade	
20	Kingsland Rd	Chesterfield	At-Grade	
21	Brinkley Rd	Chesterfield	At-Grade	
22	State Hwy 288	Chesterfield	At-Grade	
23	Old Lane	Chesterfield	At-Grade	
24	Centralia Rd	Chesterfield	At-Grade	
25	State Hwy 10 (W. Hundred Rd)	Chesterfield	Below-Grade	
26	Dodomead Rd	Chesterfield	At-Grade	North of Curtis St
27	Curtis St	Chesterfield	At-Grade	
28	West St	Chesterfield	At-Grade	
29	U.S. Hwy 1 (U.S. Hwy 301)	Chesterfield	Below-Grade	
30	Indian Hill Rd	Chesterfield	At-Grade	
31	Woods Edge Rd	Chesterfield	At-Grade	
32	Pine Forest Dr	Chesterfield	At-Grade	
33	Ellerslie Ave	Colonial Heights	Above-Grade	Dunlop (Abandoned) & Ettrick Connections
34	U.S. Hwy 1 (U.S. Hwy 301)	Colonial Heights	Below Grade	Ettrick Connection
35	Temple Ave	Colonial Heights	Above-Grade	Dunlop (Abandoned) Connection
36	Conduit Rd	Colonial Heights	At-Grade	Dunlop (Abandoned) Connection
37	Bridge St	Colonial Heights	Above-Grade	Dunlop (Abandoned) Connection

No.	Roadway Name	County/City	Type of Crossing*	Notes
38	Branders Bridge Rd	Chesterfield	At-Grade	Ettrick Connection
39	Dupuy Rd	Chesterfield		Ettrick Connection
40	State Hwy 36 (Fleet St)	Chesterfield	Below-Grade	Ettrick Connection
41	Squaw Alley	Chesterfield	At-Grade	Ettrick Connection
42	Cross St	Chesterfield	At-Grade	Ettrick Connection
43	U.S. Hwy 1 (U.S. Hwy 301)	Chesterfield	Above-Grade	Ettrick Connection
44	Phoenix St	Petersburg	At-Grade	
45	5 th St	Petersburg	At-Grade	
46	Interstate 95 (I-95)	Petersburg	Above-Grade	
47	State Hwy 36 (E. Washington St)	Petersburg	Below-Grade	
48	Siege Rd	Petersburg	Above-Grade	
49	U.S. Hwy 460	Petersburg	Above-Grade	
50	Poe Lane	Petersburg	At-Grade	
51	Wagner Rd	Petersburg	Above-Grade	
52	Interstate 295 (I-295)	Prince George	Above-Grade	
53	State Hwy 629	Prince George	At-Grade	
54	Enterprise Dr	Prince George	At-Grade	
55	State Hwy 156 (Prince George Dr)	Prince George	At-Grade	
56	Unnamed Road	Prince George	At-Grade	South of State Hwy 156
57	Unnamed Road	Prince George	At-Grade	Connects U.S. Hwy 460 to Golf Course Dr
58	Golf Course Dr	Prince George	Below-Grade	
59	Summit Lane	Prince George	At-Grade	
60	Robin Rd	Prince George	At-Grade	
61	State Hwy 625 (Arwood Rd)	Prince George	At-Grade	
62	Unnamed Road	Prince George	At-Grade	Connects to U.S. Hwy 460 from west, south of State Hwy 625
63	Alden Rd	Prince George	At-Grade	
64	State Hwy 602 (Cabin Point Rd)	Sussex	At-Grade	
65	Maifield Ave	Sussex	At-Grade	
66	State Hwy 40 (W. Main St)	Sussex	At-Grade	
67	Beaver Dam Rd	Sussex	At-Grade	
68	Unnamed Road	Sussex	At-Grade	Connects to U.S. Hwy 460 from west, south of Beaver Dam Rd
69	Walnut Hill Rd	Sussex	At-Grade	
70	Unnamed Rd	Sussex	At-Grade	Connects to U.S. Hwy 460 from west, south of Walnut Hill Rd
71	Chinquapin Rd	Sussex	At-Grade	
72	Tunnel Rd	Sussex	At-Grade	
73	State Hwy 628	Sussex	At-Grade	

No.	Roadway Name	County/City	Type of Crossing*	Notes
74	Unnamed Road	Sussex	At-Grade	Connects to Fredenburg Rd from west, south of State Hwy 628
75	Unnamed Road	Sussex	At-Grade	Connects to U.S. Hwy 460 from west
76	Unnamed Road	Sussex	At-Grade	Connects to U.S. Hwy 460 from west
77	Unnamed Road	Southampton	At-Grade	Connects to U.S. Hwy 460 from west
78	Sadler Rd	Southampton	At-Grade	
79	Unnamed Road	Southampton	At-Grade	Connects U.S Hwy 460 to Bell Rd
80	Unnamed Road	Southampton	At-Grade	Extension of Proctor's Bridge Rd that crosses U.S. Hwy 460 and rail right of way as it heads west.
81	Unnamed Road	Southampton	At-Grade	Connects to U.S. Hwy 460 from west
82	State Hwy 616	Southampton	At-Grade	
83	Unnamed Road	Southampton	At-Grade	Connects to U.S. Hwy 460 from the west
84	Tucker Swamp Rd	Southampton	Above-Grade	
85	Unnamed Road	Isle of Wight	At-Grade	Connects Zuni Circle to Thomas Wood Trail
86	Yellow Hammer Rd	Isle of Wight	At-Grade	
87	Ecella Rd	Isle of Wight	At-Grade	
88	Unnamed Road	Isle of Wight	At-Grade	South of Ecella Rd and connects to U.S. Hwy 460 from west
89	Antioch Rd	Isle of Wight	At-Grade	
90	Unnamed Road	Isle of Wight	At-Grade	Connects to U.S. Hwy 460 from west
91	U.S. Hwy 258 (S. Prince Blvd)	Isle of Wight	At-Grade	
92	State Hwy 603 (Bank St)	Isle of Wight	At-Grade	
93	Court St	Isle of Wight	At-Grade	
94	Old Suffolk Rd	Isle of Wight	At-Grade	
95	State Route 607 (Old Mill Rd)	Suffolk	At-Grade	
96	Old Myrtle Rd	Suffolk	At-Grade	
97	Kings Fork Rd	Suffolk	At-Grade	
98	Lake Meade Dr	Suffolk	At-Grade	
99	Indian Trail	Suffolk	At-Grade	
100	U.S. Hwy 58	Suffolk	Above-Grade	
101	Lake Kirby Rd (Lake Cahoon Rd)	Suffolk	Above Grade	
102	U.S. Hwy 58 Business Route (Constance Rd West)	Suffolk	At-Grade	

No.	Roadway Name	County/City	Type of Crossing*	Notes
103	Broad St	Suffolk	Above Grade	
104	Pine St	Suffolk	At-Grade	
105	State Hwy 10 (State Hwy 32)	Suffolk	At-Grade	
106	Pinner St	Suffolk	At-Grade	
107	Moore Ave	Suffolk	At-Grade	
108	Kingsboro St	Suffolk	At-Grade	
109	Suburban Dr	Suffolk	At-Grade	
110	U.S. Hwy 13 (State Hwy 337)	Suffolk	At-Grade	
111	Unnamed Road	Suffolk	At-Grade	Connects to U.S. Hwy 13 from south
112	Unnamed Road	Suffolk	At-Grade	Connects to U.S. Hwy 13 from south
113	Unnamed Road	Suffolk	At-Grade	Connects to U.S. Hwy 13 from south
114	Bob Foeller Dr	Suffolk	At-Grade	
115	Bisco St	Chesapeake	At-Grade	
116	Snowden St	Chesapeake	At-Grade	Abandoned Rail Corridor
117	Homestead Rd	Chesapeake	At-Grade	Abandoned Rail Corridor
118	U.S. Hwy 31 (Military Hwy)	Chesapeake	Above-Grade	Abandoned Rail Corridor
119	Interstate 64 (I-64)	Chesapeake	Above Grade	Abandoned Rail Corridor
120	Cavalier Blvd	Chesapeake	At-Grade	
121	Gust Lane	Chesapeake	At-Grade	
122	Deep Creek Blvd	Chesapeake	At-Grade	
123	U.S. Hwy 17 (George Washington Hwy North)	Chesapeake	At-Grade	
124	Rosemont Ave	Chesapeake	At-Grade	
125	Interstate 464 (I-464)	Chesapeake	Above-Grade	
126	U.S. Hwy 460 (Bainbridge Blvd)	Chesapeake	Above-Grade	
127	Rodgers St	Chesapeake	At-Grade	
128	Chesapeake Ave	Chesapeake	At-Grade	
129	Park Ave	Chesapeake	At-Grade	
130	Ohio St	Chesapeake	At-Grade	
131	Liberty St	Chesapeake	At-Grade	
132	U.S. Hwy 460 (22 nd St)	Chesapeake	Above-Grade	
133	Berkley Ave	Norfolk	At-Grade	First Crossing
134	Berkley Ave	Norfolk	At-Grade	Second Crossing
135	East Indian River Rd	Norfolk	At-Grade	
136	Park Ave	Norfolk	At-Grade	End of proposed HSR Corridor

Sources: GIS database (ESRI) and the most recent ADC mapping for the study area cities and counties.